



SEQUENCE LISTING

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WILSON, DAVID S.
KEEFE, ANTHONY D.

<120> STREPTAVIDIN-BINDING PEPTIDES AND USES
THEREOF

<130> 00786/388002

<140> US 10/004,381
<141> 2001-10-31

<150> US 60/244,541
<151> 2000-10-31

<160> 41

<170> FastSEQ for Windows Version 4.0

<210> 1
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<213> Artificial Sequence

<220>
<223> selected peptide

<400> 1
Met Asp Glu Lys Thr His Cys Thr Ile Ser Met Asn Gly Ala Val Pro
1 5 10 15
Leu Val Pro His His Pro Gln Gly Asp Pro Leu Arg Leu Leu His
20 25 30
Arg Pro Gln Pro Ala Leu Leu Val Arg His Pro Gln Gly Asp Leu Val
35 40 45
Ala Leu Val Glu His His Glu Gly Val Asp Arg Gly Leu Val Ala Leu
50 55 60
Pro Glu Leu His Ala Glu Leu Gly Glu Pro Val Gly Asp Leu Val
65 70 75 80
Gln Gly Pro Val Glu Gln Val Gln Gly Val Val Asp Ala Leu Val Trp
85 90 95
Arg Leu Pro Pro Ser
100

<210> 2
<211> 101
<212> PRT
<213> Artificial Sequence

<220>
<223> selected peptide

<400> 2
Met Asp Glu Lys Thr His Cys Phe His Pro Gly Asp His Leu Val Arg
1 5 10 15

Leu Val Glu Glu Leu Gln Ala Leu Ala Glu Gly Leu Gln Arg Gln Gly
 20 25 30
 Gly Arg Gln Pro His Arg Leu Pro Arg Arg Arg Pro His His Leu Gln
 35 40 45
 Leu Leu Leu Asp Glu Ala His Pro Gln Ala Gly Pro Leu Arg Glu Arg
 50 55 60
 Ala His Gln Val Asp Gly Arg Leu Leu Leu Gln His His Pro Gln Gly
 65 70 75 80
 Asp Arg Leu Leu Gln Pro Gln Asp His Pro Leu Glu Leu Val Trp
 85 90 95
 Arg Leu Pro Pro Ser
 100

<210> 3
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 3
 Met Thr Arg Arg Pro Thr Ala Ser Ser Ser Ser Cys Val Arg His Leu
 1 5 10 15
 Leu Leu Arg Gln Gly Glu His Gly His Gln Ala Leu Glu Asp Arg Asp
 20 25 30
 Lys Ala Arg His Val Arg Leu Val Glu Gly Asp Val Glu Val Leu Gly
 35 40 45
 Gly Leu Asp Arg Leu Ala Arg Ala Arg His Glu Ala Leu His Pro Gln
 50 55 60
 Ala Gly Leu Val His Leu Pro Leu His Gly Gly Asp Leu Gly Gly His
 65 70 75 80
 Leu Arg Leu Val Leu Glu Ala His Pro Gln Gly Asp Arg Leu Gly Leu
 85 90 95
 Ala Val His His His
 100

<210> 4
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 4
 Met Asp Glu Lys Thr His Trp Gly Ile Ser Thr Trp Arg Gly Glu Pro
 1 5 10 15
 Leu Leu His His Pro Gln Ala Gly Arg Leu Pro Leu Asp Arg Arg Arg
 20 25 30
 Ala Arg His Arg Arg Ile Leu Gly Ala Glu Pro Gly Gly Val Asp His
 35 40 45
 Gly Leu Arg Leu Glu Leu Leu Asp Asp His Arg Pro Leu Val Pro Asp
 50 55 60
 His His Pro Gln Arg Gly Pro Leu Gln Arg Gly Asp Leu Pro Gln Val
 65 70 75 80

Val Pro Leu Val Arg Leu Arg His Ala His Val Leu Gly Leu Gly Leu
 85 90 95
 Ala Ala Ala Thr Ile Thr
 100

<210> 5
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 5
 Met Asp Glu Lys Thr His Trp Val Asn Val Tyr His Pro Gln Gly Asp
 1 10 15
 Leu Leu Val Arg Gly His Gly His Asp Val Glu Ala Leu His Asp Gln
 20 25 30
 Gly Leu His Gln Leu Asp Leu Leu Val Gly Pro Pro Glu Val Val
 35 40 45
 Arg Ala Leu Arg Gly Glu Val Leu Gly Gly Leu Arg Arg Leu Val Pro
 50 55 60
 Leu Asp His Pro Gln Gly Glu Ala Leu Asp Gln Ala Arg Gln Arg Pro
 65 70 75 80
 Gln His Leu Leu Glu Leu His His Arg Ala Leu Pro Pro Ala Leu Val
 85 90 95
 Trp Arg Leu Pro Pro Ser
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<210> 6
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 6
 Met Asp Glu Lys Thr His Trp Leu Asn Asn Phe Glu Glu Leu Leu Ala
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 Arg Leu Asp Gly Leu Arg Glu Gly Glu Asp His Pro Leu Val Leu Arg
 20 25 30
 His His Pro Gln Gly Asp Gly Leu Leu Asp Gln Pro Leu Gly Arg His
 35 40 45
 Arg Ala Leu Asp Gly Glu Val Arg Glu Gly Asp Arg Pro Leu Asp Gln
 50 55 60
 Gly Gly Glu Glu Asp Leu Gly Ala Leu Val Asp Asp Asp Gly Glu Val
 65 70 75 80
 Leu Asp Gly Leu Val His Val Gly Val His Val His Asp Pro Leu Val
 85 90 95
 Cys Gly Cys His His His
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<210> 7
 <211> 101

<212> PRT
<213> Artificial Sequence

<220>
<223> selected peptide

<400> 7
Met Asp Glu Lys Thr His Trp Phe Gly Thr Leu Asn Ser Phe Pro Thr
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His Trp Met Ser Ala Val Gly Asn Gly Lys Ile Asp Cys Ser Phe Asn
20 25 30
Met Asn Leu Ser Leu Asn His Trp Leu Ser Ser Gly His Pro Asp Gly
35 40 45
Ala Leu Asp Asp Gln Leu His Pro Gln Gly Asp Ala Leu Val Gly Arg
50 55 60
Asp Asp Gly Val Val Gln Ala Leu Arg Leu Glu Gly Gln His Gln His
65 70 75 80
Arg Arg Leu Ala Gln Arg Arg Ala Asp Arg His Arg Gln Leu Val Trp
85 90 95
Arg Leu Pro Pro Ser
100

<210> 8
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> selected peptide

<400> 8
Met Asp Glu Lys Thr His Cys Thr Ile Glu Leu Asn Phe Ser Phe Thr
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His Trp Lys Leu His His His Pro Gln Gly Asp Ala Leu Leu Asp Asp
20 25 30
Gly Val Arg Pro His His Pro Leu Ala Asp Glu Gly Gly Gly Leu Asp
35 40 45
Gln Gly Leu Gly His Arg Arg Gly Val Val Ala Glu Arg Leu Ala Arg
50 55 60
Arg Asp Pro Glu Val Leu Glu Gly Leu Val Glu Arg His Arg Gly Leu
65 70 75 80
Val Pro Arg Leu Arg His Gly Gly Glu Arg His Ala Glu Pro Leu Val
85 90 95
Trp Arg Leu Pro Pro Ser
100

<210> 9
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> selected peptide

<400> 9
Met Asp Glu Lys Thr His Cys Asn Thr Gly Leu Tyr Asp Gly Ala Ala

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1      5      10      15
Asp Cys Phe Asn Glu Leu Asn Lys Asp Val Ala Pro Leu Val Glu Gly
      20      25      30
Arg His Asp Leu Val Glu Gly Leu Leu Glu Arg His Pro Gln Gly
      35      40      45
Asp Pro Leu Val Ala His Arg Gln Leu Val His His Pro Leu Leu Gly
      50      55      60
Arg Gly Glu Arg His Arg Arg Ala Leu Val Pro Gln Gln Glu His Gln
      65      70      75      80
Pro His Arg Leu Gln Pro Val Val Asp Leu Gly Arg Arg Arg Leu Val
      85      90      95
Trp Arg Leu Pro Pro Ser
      100

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<210> 10
 <211> 103
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

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      1      5      10      15
Gly Leu Leu Leu His Asp His Pro Gln Arg Leu Leu Leu Glu Pro Arg
      20      25      30
Gly Pro Arg Pro Leu Arg Gly Leu Val His Glu Arg Gly His Gln Pro
      35      40      45
Gln Pro Leu Ala Gly Arg Val Glu Glu Ala Asp Gly Gly Leu Leu Arg
      50      55      60
Asp Gly Gly Gly Glu Leu Glu Pro Leu Val Arg Glu Gly Glu Asp His
      65      70      75      80
Leu Glu Pro Leu Asp Asp Glu Leu Asp Ala Gly Pro Arg Gly Leu Val
      85      90      95
Trp Arg Leu Pro His His His
      100

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<210> 11
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

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<400> 11
Met Asp Glu Lys Thr His Trp His Glu Arg Val His His Leu Ala Asp
      1      5      10      15
Gly Leu Glu Gln His Pro Gln Gly Gln Arg Arg Pro Leu Val Glu Arg
      20      25      30
His Arg Gln Val Pro Arg Gly Leu Val Arg Glu Leu Gln His Glu Gly
      35      40      45
Leu Pro Leu Glu His Pro Ala Gly Val His Val Ile Arg Leu His Gln
      50      55      60
Gly Asp Asp Arg Asp Val Asp Gly Leu Val Asp Gly His Gly Arg Asp

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65 Val Arg Gly Leu Glu Arg Glu Val Gly Asp Gly Pro His Arg Leu Val 80
 70
 85
 90
 95
 100 Trp Arg Leu Pro Pro Ser

<210> 12
 <211> 101
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 12
 Met Asp Lys Asp Pro Leu Leu Glu Glu Leu Glu Glu Leu Arg Glu Arg 15
 1 Leu Val His His Pro Gln Gly Gly Leu Leu Pro Leu Arg Gly Gln Val 30
 20 Gly His Asp Ala Glu Arg Leu Gly Ala Glu Val Asp Asp Leu Arg Gly 45
 35 Gly Leu Leu Asp Glu Pro Gln Arg Ala Val Ala Gly Leu His His Val 60
 50 Pro His Arg Val Gly Gln Arg Leu Val His Glu Val Arg Glu Leu Asp 80
 65 Glu Gly Leu Leu Asp Gln Arg Asp Asp Leu Arg Gln Arg Leu Val Trp 95
 85
 100 Arg Leu Pro Pro Ser

<210> 13
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 13
 Met Glu Arg Glu Asp Pro Leu Asp Glu Gln Leu Arg Glu Leu Arg Glu 15
 1 Ala Leu Val Asp His Pro Gln Gly Gly Ala Gln Ala Leu His Arg His 30
 20 Asp Gly Gly Glu His Val Pro Leu Arg Arg Val Gln His Arg Leu Gln 45
 35 Pro Gly Leu Gln His His Leu Glu Pro Gln Pro Leu Gly Leu Leu Gly 60
 50 Glu Leu Gln Ala Arg Leu Gln Pro Leu Ala Gly Glu His Glu Gly Asp 80
 65 Gly Ala Gly Leu Gln Arg Val Pro Gly His Gln Gly Arg Arg Leu Val 95
 85
 100 Trp Arg Leu Pro Pro Ser

<210> 14

<211> 101
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 14
 Met Asp Glu Lys Thr His Arg Thr Leu Ser Val Ser Leu Ser Phe Asn
 1 5 10 15
 Asp Trp Leu Gly Gln Thr Lys Ala Cys Trp Arg Leu Val Glu Gly Leu
 20 25 30
 His Gly His Pro Gln Gly Leu Val Arg Glu His Glu Val Asp Val Leu
 35 40 45
 Pro Leu Ala Glu Glu Val Gln Gln Val Val Gly Gly Leu Ala Asp Gly
 50 55 60
 Val Glu Gln Pro Gly Gly Gly Leu Leu His Arg Ala Gln Arg Val Asp
 65 70 75 80
 His Pro Leu Pro Asp His Ala Gly Gln Val Leu Gly Arg Leu Val Trp
 85 90 95
 Arg Leu Pro Pro Ser
 100

<210> 15
 <211> 101
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 15
 Met Asp Glu Lys Thr His Trp Leu Glu Asp Leu Lys Gly Val Leu Lys
 1 5 10 15
 Asp Cys Leu Lys Asp Leu Met Asp Phe Thr Lys Asp Cys Arg Ser Pro
 20 25 30
 Arg Val Gln Pro Gln Pro Leu Leu His His Asp Arg Gly Glu Pro Val
 35 40 45
 Pro Leu Leu Arg Glu Ala Gly Arg Asp Leu Gly Gly Leu Gly Pro Arg
 50 55 60
 Ala Pro Arg Gln Ala Arg Pro Leu His His Gly Arg His Asp Leu His
 65 70 75 80
 Glu Pro Leu Val Leu Gln Asp His Pro Gln Gly Gly Pro Leu Val Cys
 85 90 95
 Gly Cys His His His
 100

<210> 16
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 16

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Met Asp Glu Lys Thr His Trp Val Leu Gln Leu His Pro Gln Gly Asp
 1          5          10          15
Arg Leu Gly Pro Arg His Gly Gly Asp Asp Val Arg Leu Val Gly Gln
          20          25          30
Gly Glu Gly Val Leu Glu Gly Leu Asp Gly Arg Pro Arg Arg Arg Arg
          35          40          45
His Arg Leu Pro Arg Glu Asp Glu His Arg Val Arg Ala Leu Val Asp
          50          55          60
Gln Val Arg Asp Leu Ala Glu Arg Leu Val Glu Glu Val Asp Gly Gly
65          70          75          80
Val Glu Ala Leu Arg His Leu Gly Leu Pro Gln Asp Glu Pro Arg Ser
          85          90          95
Gly Gly Cys His His His
          100

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<210> 17
 <211> 102
 <212> PRT
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<220>
 <223> selected peptide

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<400> 17
Met Asp Glu Lys Thr His Trp Val Gly Asp Leu Gln Glu Pro Leu Gly
 1          5          10          15
Pro Leu His Gly Gly Val Gly Glu Val Pro Gly Gly Leu Val Leu Arg
          20          25          30
His His Pro Gln Arg Asp Arg Leu Val Asp Gly Val Gly Pro His Gly
          35          40          45
Arg Ala Leu Ala Arg Arg Pro His Arg Val Val Glu Gly Leu His His
          50          55          60
Leu Leu Gln Arg Gly Gly Glu Arg Leu Pro Pro Asp Gly Pro Arg Gln
65          70          75          80
Leu Gly Leu Leu Gly Gly Glu Leu Asp Arg Ala Asp Pro Ala Leu Val
          85          90          95
Trp Arg Leu Pro Pro Ser
          100

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<210> 18
 <211> 101
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

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<400> 18
Met Asp Glu Lys Thr His Cys Ala Val Asn Val Asn Val Gly Leu Thr
 1          5          10          15
His Trp Cys His Arg Val Ala His Leu Gln Pro Leu Asp Pro His Pro
          20          25          30
Gln Gly Asp His Leu Arg Leu Glu Pro Leu Gly His Ala Leu Val Asp
          35          40          45
Pro Leu Val Gln Gly Val Glu Glu Val Val Arg Pro Leu Gln Leu Asp
          50          55          60

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Val Gly Val Gln Arg Val Ala Leu Val Glu Gln Val Ala Glu Val Gly
65 70 75 80
Glu Gly Leu Asp His Glu Ala Gly Gln Ala His Gly Ala Leu Val Trp
85 90 95
Arg Leu Pro Pro Ser
100

<210> 19
<211> 101
<212> PRT
<213> Artificial Sequence

<220>
<223> selected peptide

<400> 19
Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
1 5 10 15
Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
20 25 30
Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu Asp Val Asp Glu
35 40 45
Gly Leu Val Gln Asp Leu His Gly Val Val Ala Gly Leu Leu Asp Pro
50 55 60
Val Glu Lys Leu Leu Thr Asp Trp Phe Lys Lys Phe Lys Asn Val Ser
65 70 75 80
Lys Asp Cys Lys Met Thr Phe Tyr Leu Glu Met Tyr Asp Trp Ser Gly
85 90 95
Gly Cys His His His
100

<210> 20
<211> 102
<212> PRT
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<220>
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<400> 20
Met Asn Glu Lys Thr His Cys Lys Leu Asn Phe Lys Val Asn Ile Ala
1 5 10 15
Asp Trp Leu Ala Glu Phe His Gly Gly Gly Gln Gly Leu Leu Gly Arg
20 25 30
Arg Asp Gly Val Val Gln Arg Leu Val Asp Gly Val Gln Glu Arg Val
35 40 45
Glu Arg Leu Asp Arg Asp Pro Gly Leu Gly Asp Leu Arg Leu Glu Leu
50 55 60
His His Arg Asp His Arg Leu Arg Leu Gly Gly Glu His Leu Leu Arg
65 70 75 80
Asp His Pro Leu Glu Pro Asp Asp His Leu Val Val Gly Gly Leu Val
85 90 95
Trp Arg Leu Pro Pro Ser
100

<210> 21
 <211> 101
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 21
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10 15
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu Asp Val Asp Glu
 35 40 45
 Gly Leu Val Gln Asp Leu His Gly Val Val Ala Gly Leu Leu Asp Pro
 50 55 60
 Val Glu Lys Leu Leu Thr Asp Trp Phe Lys Lys Phe Lys Asn Val Ser
 65 70 75 80
 Lys Asp Cys Lys Met Thr Phe Tyr Leu Glu Met Tyr Asp Trp Ser Gly
 85 90 95
 Gly Cys Lys Leu Gly
 100

<210> 22
 <211> 89
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 22
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10 15
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu Asp Val Asp Glu
 35 40 45
 Gly Leu Val Gln Asp Leu His Gly Val Val Ala Gly Leu Leu Asp Pro
 50 55 60
 Val Glu Lys Leu Leu Thr Asp Trp Phe Lys Lys Phe Lys Asn Val Ser
 65 70 75 80
 Met Met Ser Gly Gly Cys Lys Leu Gly
 85

<210> 23
 <211> 75
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 23
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly

1 5 10 15
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu Asp Val Asp Glu
 35 40 45
 Gly Leu Val Gln Asp Leu His Gly Val Val Ala Gly Leu Leu Asp Pro
 50 55 60
 Val Glu Met Met Ser Gly Gly Cys Lys Leu Gly
 65 70 75

<210> 24
 <211> 61
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 24 15
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu Asp Val Asp Glu
 35 40 45
 Gly Leu Val Gln Met Met Ser Gly Gly Cys Lys Leu Gly
 50 55 60

<210> 25
 <211> 47
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 25 15
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro Met Met Ser Gly Gly Cys Lys Leu Gly
 35 40 45

<210> 26
 <211> 47
 <212> PRT
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<400> 26 15
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10

Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Gly
 20 25 30
 Ala Gly Gln Arg Glu Pro Met Met Ser Gly Gly Cys Lys Leu Gly
 35 40 45

<210> 27
 <211> 39
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 27
 Met Asp Gly His Val Val Glu Gly Leu Ala Gly Glu Leu Glu Gln Leu
 1 5 10 15
 Arg Ala Arg Leu Glu His His Pro Gln Gly Gln Arg Glu Pro Met Met
 20 25 30
 Ser Gly Gly Cys Lys Leu Gly
 35

<210> 28
 <211> 89
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 28
 Met Asp Glu Gly Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu
 1 5 10 15
 Glu His His Pro Gln Gly Gln Arg Glu Pro Leu Val Gln Glu Val Glu
 20 25 30
 Asp Val Asp Glu Gly Leu Val Gln Asp Leu His Gly Val Val Ala Gly
 35 40 45
 Leu Leu Asp Pro Val Glu Lys Leu Leu Thr Asp Trp Phe Lys Lys Phe
 50 55 60
 Lys Asn Val Ser Lys Asp Cys Lys Met Thr Phe Tyr Leu Glu Met Tyr
 65 70 75 80
 Asp Trp Ser Gly Gly Cys Lys Leu Gly
 85

<210> 29
 <211> 29
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> selected peptide

<400> 29
 Met Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro Gln Gly
 1 5 10 15
 Gln Arg Glu Pro Met Met Ser Gly Gly Cys Lys Leu Gly

<210> 30
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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<400> 30
 atagccggtg ccaagcttgc agccgccaga ccagt

<210> 31
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

35

<400> 31
 acuggucugg cggcugcaag cuuggcaccg gcuaa

<210> 32
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 32
 Trp Ser Gly Gly Cys His His His His His Ser Ser Ala
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<210> 33
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> designed peptide

<400> 33
 Trp Ser Gly Gly Cys Lys Leu Gly Thr Gly Tyr
 1 5 10

<210> 34
 <211> 44
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> designed peptide

<400> 34
 Met Asp Glu Ala His Pro Gln Ala Gly Pro Val Asp Gln Ala Asp Ala
 1 5 10 15
 Arg Leu Val Gln Gln Gly Ala Leu Gln His His Pro Gln Gly Asp Arg
 20 25 30
 Met Met Ser Gly Gly Cys Lys Leu Gly Thr Gly Tyr
 35 40

<210> 35
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 35
 Met Asp Glu Lys Thr Thr Gly Trp Arg Gly Gly His Val Val Glu Gly
 1 5 10 15
 Leu Ala Gly Glu Leu Glu Gln Leu Arg Ala Arg Leu Glu His His Pro
 20 25 30
 Gln Gly Gln Arg Glu Pro
 35

<210> 36
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 <212> PRT
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<220>
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<400> 36
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<210> 37
 <211> 6688
 <212> DNA
 <213> Artificial Sequence

<220>
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gaaccctaaa gggagcccc gatthtagagc ttgacgggga aagccggcga acgtggcgag 6420
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gccca

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<210> 41
<211> 426
<212> PRT
<213> Artificial Sequence

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<220>
<223> designed protein

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<400> 41
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Gly Tyr Asn Gly Leu Ala Glu Val Gly Lys Lys Phe Glu Lys Asp Thr
20          25          30
Gly Ile Lys Val Thr Val Glu His Pro Asp Lys Leu Glu Glu Lys Phe
35          40          45
Pro Gln Val Ala Ala Thr Gly Asp Gly Pro Asp Ile Ile Phe Trp Ala
50          55          60
His Asp Arg Phe Gly Gly Tyr Ala Gln Ser Gly Leu Leu Ala Glu Ile
65          70          75          80
Thr Pro Asp Lys Ala Phe Gln Asp Lys Leu Tyr Pro Phe Thr Trp Asp
85          90          95
Ala Val Arg Tyr Asn Gly Lys Leu Ile Ala Tyr Pro Ile Ala Val Glu
100         105         110
Ala Leu Ser Leu Ile Tyr Asn Lys Asp Leu Leu Pro Asn Pro Pro Lys
115         120         125
Thr Trp Glu Glu Ile Pro Ala Leu Asp Lys Glu Leu Lys Ala Lys Gly
130         135         140
Lys Ser Ala Leu Met Phe Asn Leu Gln Glu Pro Tyr Phe Thr Trp Pro
145         150         155         160
Leu Ile Ala Ala Asp Gly Gly Tyr Ala Phe Lys Tyr Glu Asn Gly Lys
165         170         175
Tyr Asp Ile Lys Asp Val Gly Val Asp Asn Ala Gly Ala Lys Ala Gly
180         185         190
Leu Thr Phe Leu Val Asp Leu Ile Lys Asn Lys His Met Asn Ala Asp

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195 200 205
 Thr Asp Tyr Ser Ile Ala Glu Ala Ala Phe Asn Lys Gly Glu Thr Ala
 210 215 220
 Met Thr Ile Asn Gly Pro Trp Ala Trp Ser Asn Ile Asp Thr Ser Lys
 225 230 235 240
 Val Asn Tyr Gly Val Thr Val Leu Pro Thr Phe Lys Gly Gln Pro Ser
 245 250 255
 Lys Pro Phe Val Gly Val Leu Ser Ala Gly Ile Asn Ala Ala Ser Pro
 260 265 270
 Asn Lys Glu Leu Ala Lys Glu Phe Leu Glu Asn Tyr Leu Leu Thr Asp
 275 280 285
 Glu Gly Leu Glu Ala Val Asn Lys Asp Lys Pro Leu Gly Ala Val Ala
 290 295 300
 Leu Lys Ser Tyr Glu Glu Leu Ala Lys Asp Pro Arg Ile Ala Ala
 305 310 315 320
 Thr Met Glu Asn Ala Gln Lys Gly Glu Ile Met Pro Asn Ile Pro Gln
 325 330 335
 Met Ser Ala Phe Trp Tyr Ala Val Arg Thr Ala Val Ile Asn Ala Ala
 340 345 350
 Ser Gly Arg Gln Thr Val Asp Glu Ala Leu Lys Asp Ala Gln Thr Asn
 355 360 365
 Ser Ser Ser Gly Gly Ser Gly Ser Gly Met Asp Glu Lys Thr Thr Gly
 370 375 380
 Trp Arg Gly Gly His Val Val Glu Gly Leu Ala Gly Glu Leu Glu Gln
 385 390 395 400
 Leu Arg Ala Arg Leu Glu His His Pro Gln Gly Gln Arg Glu Pro Gly
 405 410 415
 Ser Gly His His His His His His Glu Phe
 420 425